DIO9201
Digital I/O Card

User's Manual (V1.3)

健昇科技股份有限公司

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Correction record

Version	Record
V1.2->V1.3	Modify 4. Layout and dimensions 5. Pin definitions 6. I/O interface diagram

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Notes on hardware installation

Please follow step by step as you are installing the control cards.

1. Be sure your system is power off.
2. Be sure your external power supply for the wiring board is power off.
3. Plug your control card in slot, and make sure the golden fingers are put in right contacts.
4. Fasten the screw to fix the card.
5. Connect the cable between the card and wiring board.
6. Connect the external power supply for the wiring board.
7. Recheck everything is OK before system power on.
8. External power on.

Congratulation! You have it.

For more detail of step by step installation guide, please refer the file “installation.pdf “ on the CD come with the product or register as a member of our user’s club at:

http://automation.com.tw/

to download the complementary documents.

1. Forward

Thank you for your selection of DIO9201 DIGITAL I/O card for industrial IBM compatible PC.

In the field of industrial control, digital I/O is generally controlled under a microprocessor, and owing to their specific consideration of industrial environment, it is quite different from the laboratory requirement.

JS Automation Corp. has been in this field more than ten years and got the know-how of preventing noise interfered from the I/O circuit, which makes the difference from others, and we wish the card that will be helpful to your project.

Other DIO series products:

DIO2232	32 channel input and 32 channel output isolated digital I/O card (ISA bus)
DIO2248	48 channel input and 16 channel output isolated digital I/O card (ISA bus)
DIO2264	64 channel input isolated digital I/O card (ISA bus)
DIO3206	48 channel TTL digital I/O Card (PCI bus)
DIO3208B	8 channel input and 8 channel relay output isolated digital I/O card (PCI bus)
DIO3216B	16 channel input and 16 channel output isolated digital I/O card (PCI bus)
DIO3217	16 channel input and 16 channel output isolated digital I/O card (PCI bus) with multifunction timer/counter
DIO3232	32 channel input and 32 channel output isolated digital I/O card (PCI bus)
DIO3248	48 channel input and 16 channel output isolated digital I/O card (PCI bus)
DIO3264	64 channel input isolated digital I/O card (PCI bus)
DIO4264	64 TTL digital I/O PC-104 Module
DIO6208	8 channel input and 8 channel relay output isolated digital I/O PCI-104 Module
DIO6216	16 channel input and 16 channel relay output isolated digital I/O PCI-104 Module

Any comment is welcome,
please visit our website
http://www.automation.com.tw/
http://www.automation-js.com/ for the up to date information.

2. Features

2.1 Main card

2.1.1 Photo-isolated circuit design provides high noise immunity.

2.1.2 I/P debounce circuit prevents jittering I/P.

2.1.3 Hardware prohibited power-on transient at O/P.

2.1.4 Provide 16 photo-isolated I/P and 16 photo-isolated O/P per card.

2.1.5 Each O/P has free-wheel diode and its drive capacity is 500mA.

2.1.6 On board WDT (watch-dog timer) to shutdown O/P during computer is malfunction.

2.1.7 Two flat cables, easy connect to terminal board.

2.1.8 Half card size, fit for all type of PC.

2.2 Din rail mounted wiring board

2.2.1 ADP9201DIN Din rail mounted wiring board

2.2.2 JS51053 20P Din rail mounted dummy wiring board

3. Specifications

3.1 DIO9201 Main card

Digital Input

3.1.1 Input : 16 photo-isolated

3.1.2 ON State : 2.8Vdc(max) 4.5mA(min)

3.1.3 OFF State : 8Vdc(min) 3mA(max)

3.1.4 Switching Speed : 2.2KHz max. (with on board debounce circuit)

Digital Output

3.1.5 Output : 16 photo-isolated

3.1.6 Output Range : Open collector 0 ~ 45 Vdc (on card)

3.1.7 Output Rating : 3A @250Vac, 30Vdc (Relay)
1A @ 24Vdc (PMOS)
2A @ 240Vac (SSR)

3.1.8 Sink Current : 500mA(peak) per channel (on card)

3.1.9 Switching Speed : 20KHz(max)(MOS out only)

General

3.1.10 Insulation Resistance : 100M Ohm (min) at 1000Vdc

3.1.11 Isolation Voltage : 2500Vac 1Min

3.1.12 Connector : Two 20-pin male flat-cable connectors

3.1.13 Operation Temperature : 0 to +70 degree C

3.1.14 Storage Temperature : -20 to +80 degree C

3.1.15 Operation Humidity : 5~95% RH, non-condensing

3.1.16 Dimensions : 175(W)*110(H) mm , 6.9(W)*4.4(H)in

3.2 Din rail mounted wiring board

ADP9201DIN Din rail mounted wiring board

3.2.1 External Supply : DC 24V ± 4V

3.2.2 Input : 8 with LED indicator

3.2.3 Output: ADP9201DIN(R) : 8 relays (3A @250Vac, 3A @30Vdc) with LED indicator
ADP9201DIN(S) : 8 SSR (2A @240Vac) with LED indicator
ADP9201DIN(P) : 8 PMOS (Source 1A @24Vdc) with LED Indicator

3.2.4 Connector: One 20-pin male flat-cable connector

3.2.5 Operation Temperature: 0 to +70 degree C

3.2.6 Operation Humidity: RH5~95%, non-condensing

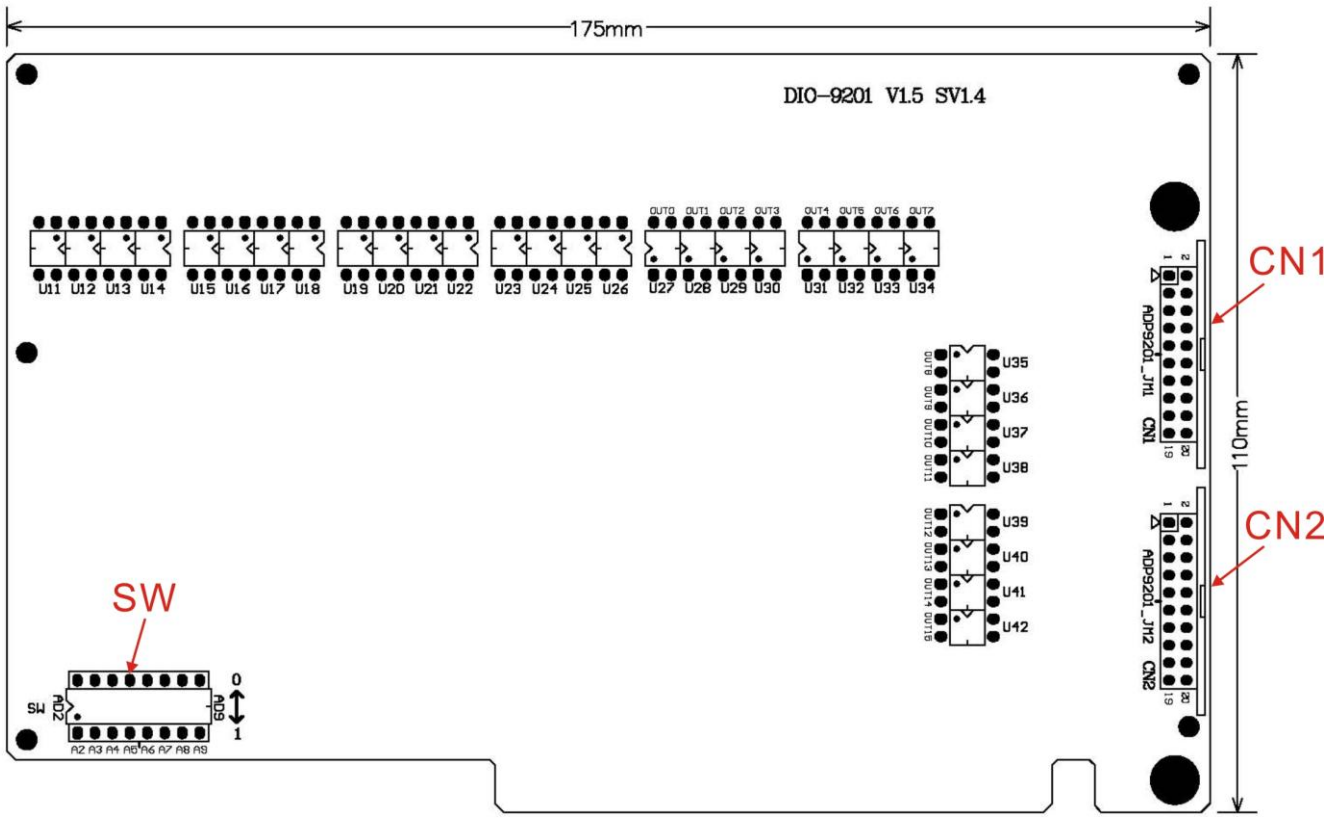
3.2.7 Dimension: ADP9201DIN(R) / (P) : 86(W) * 103(L) *45(H)mm;
3.4(W)*4.1(L)*1.8(H)in
ADP9201DIN(S) : 86(W) * 103(L) *50(H)mm
3.4(W)*4.1(L)*2.0(H)in

JS51053 20P Din rail mounted dummy wiring board

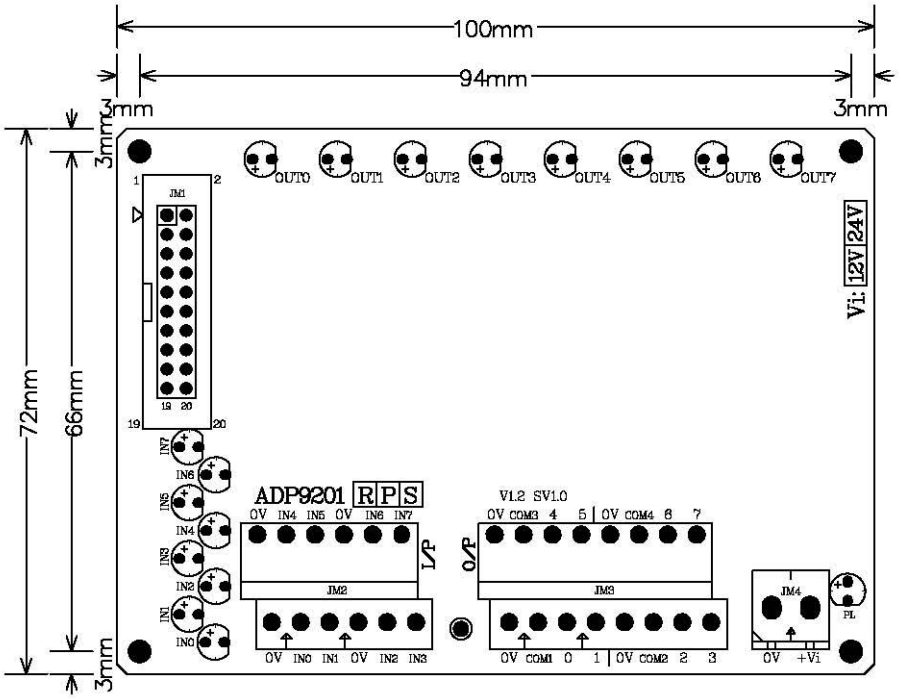
3.2.8 Dimension: 86(W)*79(L)*52(H)mm, 3.4(W)*3.2(L)*2.1(H)in

4. Layout and dimensions

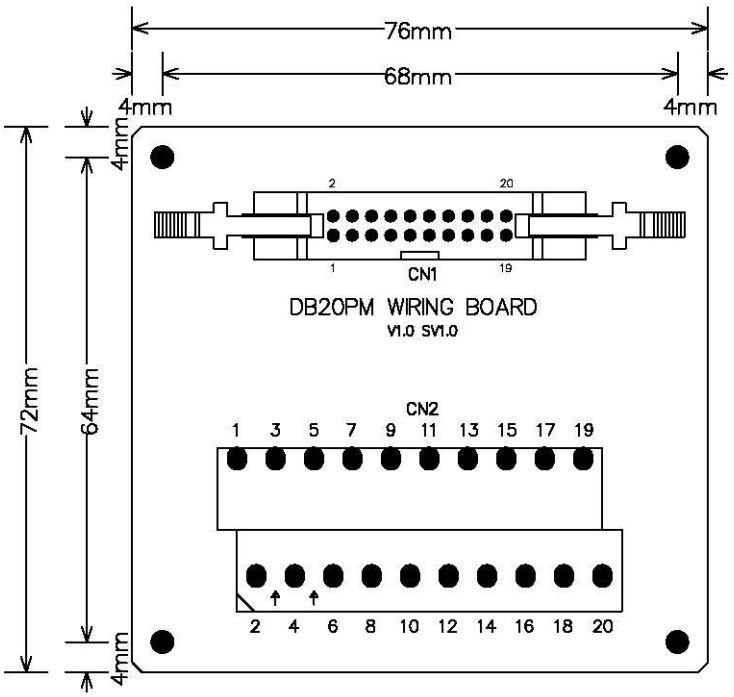
4.1 DIO9201 Main card



4.2 ADP9201DIN Din rail mounted wiring board

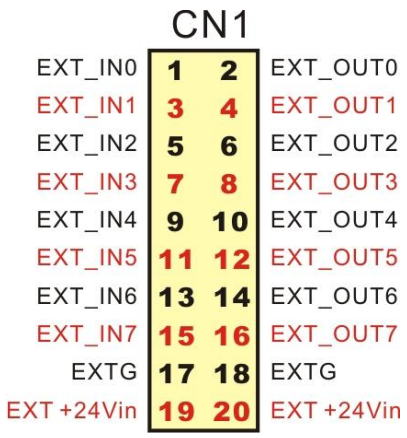


4.3 JS51053 for CN1/CN2 20PM Din rail mounted dummy wiring board

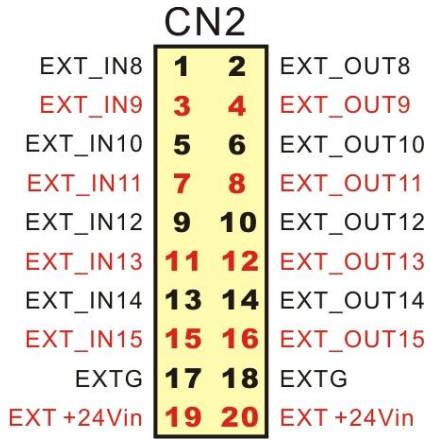


5. Pin definitions

PIN	Descriptions		PIN	Descriptions
1	EXT_IN0		2	EXT_OUT0
3	EXT_IN1		4	EXT_OUT1
5	EXT_IN2		6	EXT_OUT2
7	EXT_IN3		8	EXT_OUT3
9	EXT_IN4		10	EXT_OUT4
11	EXT_IN5		12	EXT_OUT5
13	EXT_IN6		14	EXT_OUT6
15	EXT_IN7		16	EXT_OUT7
17	EXTG		18	EXTG
19	+24Ve		20	+24Ve

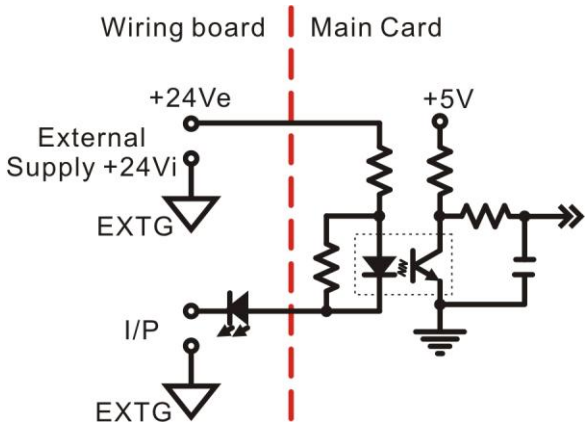


PIN	Descriptions		PIN	Descriptions
1	EXT_IN8		2	EXT_OUT8
3	EXT_IN9		4	EXT_OUT9
5	EXT_IN10		6	EXT_OUT10
7	EXT_IN11		8	EXT_OUT11
9	EXT_IN12		10	EXT_OUT12
11	EXT_IN13		12	EXT_OUT13
13	EXT_IN14		14	EXT_OUT14
15	EXT_IN15		16	EXT_OUT15
17	EXTG		18	EXTG
19	+24Ve		20	+24Ve



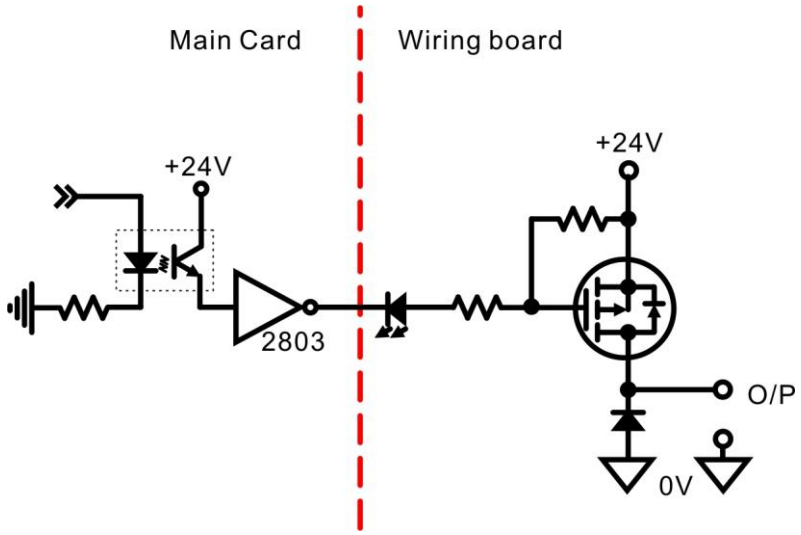
6. I/O interface diagram

6.1 Input diagram

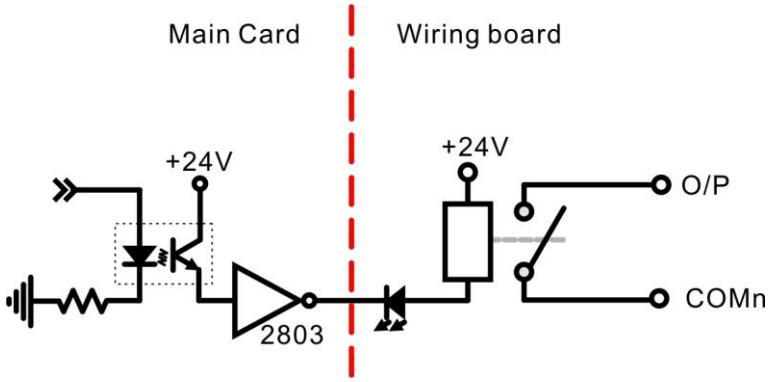


6.2 Output diagram

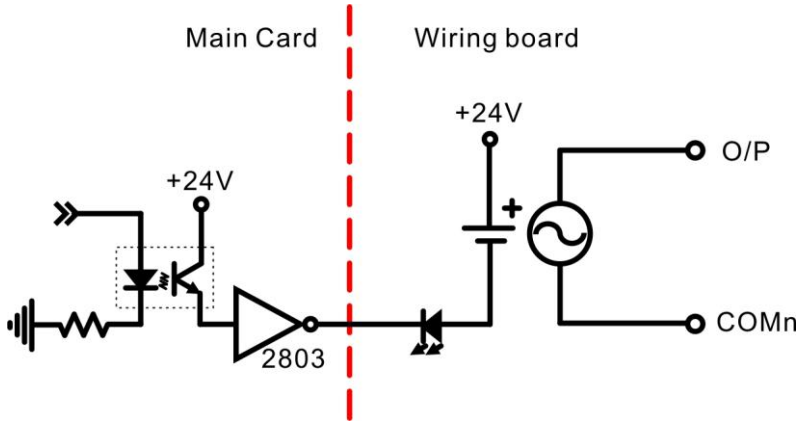
Type 1 output : (PMOS)



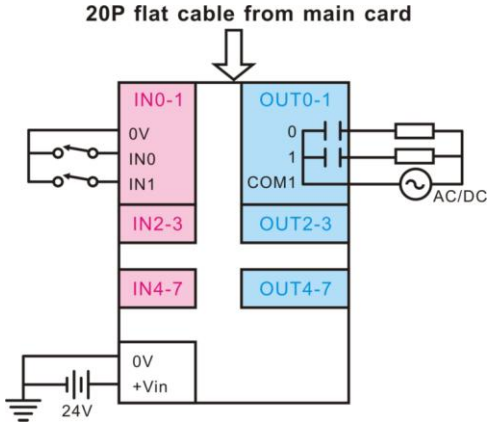
Type 2 output : (Relay)



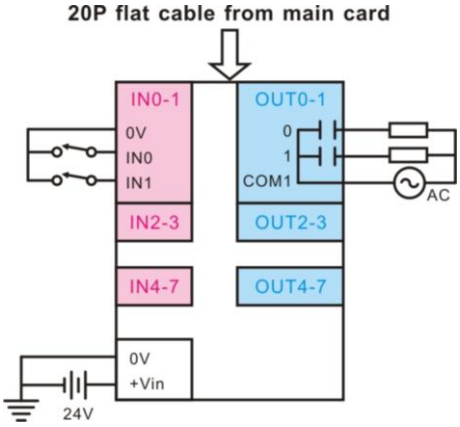
Type 3 output : (SSR)



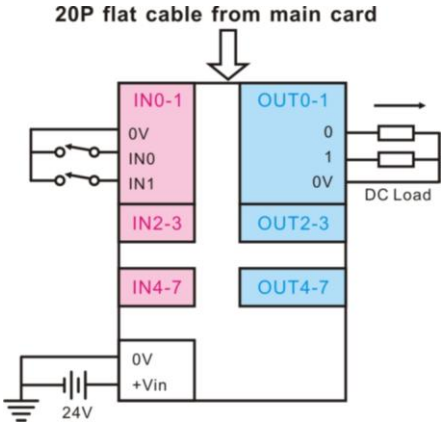
7. External wiring diagram



wiring board with Relay output



wiring board with SSR output



wiring board with PMOS output

8. Installation

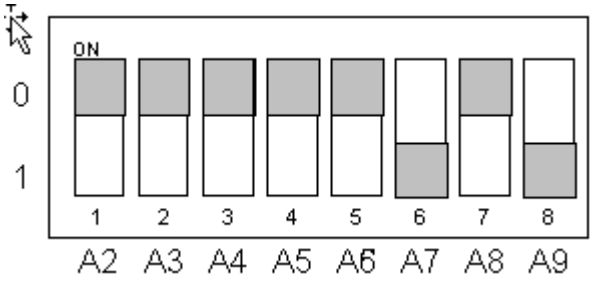
8.1 Card address setting

The DIO9201 card occupied 4 I/O addresses and can be set at any location by DIP switch on card.

Any DIP switch set "on" position means a "zero" in the corresponding address line and a "off" position means a "one" in the corresponding address line.

For example, we wish to set the card address at 280h - 283h. We should set as follows:

p.s. A1 and A0 are forced to “zero” setting



8.2 I/O descriptions

	READ	WRITE
BASE ADDRESS	I/P DATA FROM CN1	O/P DATA TO CN1
BASE ADDRESS+1	I/P DATA FROM CN2	O/P DATA TO CN2
BASE ADDRESS+2	UNDEFINE	UNDEFINE
BASE ADDRESS+3	UNDEFINE	DISABLE WDT

Be sure to check the I/O address to prevent conflict with other cards.

To prevent the transient and undefine states occurred mistakes to O/P during power on stage, the hardware prohibited by a protection circuit. The protection will not release to work until first writing O/P data on both CN1 and CN2 be finished. After the writing, the O/P of CN1 and CN2 will simultaneously enabled.

9. Noise immunity and the use of watch-dog timer

Any malfunction of computer hardware or software will cause mistakes result on O/P's, and meanwhile cause a harm. The causes of malfunctions are mainly noise, which is generated from external inductance load at random.

JS Automation Corp. put special emphasis on the noise immunity of I/O interface which is often mishandled by some designer (maybe they put much effort on power line noise, but the result is not so significant as expected).

In addition to the noise immunity consideration, we also design a watch-dog timer to monitoring the system I/O status. Basically , the watch-dog timer is a retriggerable timer, if the I/O has been normally updated (update rate less than 1s) by the computer, it will do nothing but enable the O/P. If any malfunction occurred and the computer does not update or the update rate too slow, the watch-dog timer will disable all the O/P to prevent any harm.

To use DIO9201 card will help you:

1. To prevent the noise interference from the I/O.
2. To prevent malfunction of I/O.

We also provide 2 functions about the watch-dog timer:

Shorts the jumper will disable the function of watch-dog timer.
Write the base address+3 will temporary disable the watch-dog timer and any normal read or write to the CN1 or CN2 port will restart the function.

10. Ordering information

PRODUCT	DESCRIPTIONS
DIO9201	32-channel Digital I/O Card for 16 DI and 16 D0 Photo-coupler isolated
ADP9201DIN(R)	DIN rail mounted wiring board with 16 I/O LED indicators and relay output for 8 DI, 8DO
ADP9201DIN(P)	DIN rail mounted wiring board with 16 I/O LED indicators and PMOS output for 8 DI, 8DO
ADP9201DIN(S)	DIN rail mounted wiring board with 16 I/O LED indicators and SSR output for 8 DI, 8DO
JS51053	DIN rail mounted dummy wiring board
M23207	20-pin flat cable 1.5 M
M23209	20-pin flat cable 3.0 M